

IN THE CLAIMS

Please cancel claims 1-19.

Please add the following new claim 20:

20. (New) An electrode structure adapted for use with a fuel cell system, characterized in that the electrode structure comprises a silicon substrate having one or more selectively doped regions thereon, wherein each of the one or more selectively doped regions has a resistivity of approximately $50 \text{ m } \Omega \text{ cm}$ and is adapted to function as a current collector for the transmission of an electrical current, and wherein the silicon substrate further comprises one or more discrete porous bulk matrix regions disposed across a top surface, wherein each of the one or more discrete bulk matrix porous regions is defined by a plurality pores that extend into the silicon substrate, wherein the plurality of pores defines inner pore surfaces, wherein the inner pores surfaces have catalyst particles uniformly dispersed thereon, and wherein the one or more selectively doped regions corresponds to the one or more discrete porous bulk matrix regions, and wherein the plurality of pores are interconnecting mesoporous acicular pores, interconnecting macroporous acicular pores, or a combination thereof.